Aviation Investigation Final Report

Location:	Arctic Village, Alaska	**Accident Number:**	ANC22FA066
Date & Time:	August 11, 2022, 11:52 Local	**Registration:**	N3937M
Aircraft:	Piper PA-12	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was returning from a solo hunting trip when the accident occurred. There were no reported distress calls or radio communications from the pilot. The next day a pilot who was overflying the area spotted the airplane wreckage about 2 nautical miles (nm) west of a gravel airstrip. A review of the data from the accident pilot's GPS revealed that the airplane departed the gravel strip to the south and then made a right turn into a mountain valley. The flight track continued west up the valley about 300 to 400 ft above ground level (agl) for about 2 nm, then made a sharp left turn and descended to the ground.

The airplane impacted the ground in a nose-low attitude and came to rest upright. The forward fuselage and cockpit area were crushed upward and aft. Flight control continuity was confirmed from all flight control surfaces, through a few impact separations, to the cockpit controls. The flaps were partially extended. The pitch trim jackscrew was found in a full nose-up position. The propeller damage signatures were indicative of the engine operating at the time of impact. Examination of the airframe and engine did not reveal any preaccident mechanical malfunctions or failures that would have precluded normal operation. The engine data monitor data indicated the engine was operating normally with no anomalies noted.

A postaccident weight calculation, including fuel, revealed the airplane was about 61 lbs over its maximum gross weight. The airplane's center of gravity could not be calculated since the exact location/station of the cargo could not be determined.

The pilot who discovered the wreckage stated that, on the afternoon of the accident, there was significant wind shear in the area with sustained wind at least 20 kts and gusting to at least 30 kts. He stated that the wind gusts were violent, which made him park his airplane on an airstrip about 15 miles east of the gravel airstrip and wait for the wind to subside. He added that

another pilot who flew northbound over the gravel strip a few hours after the accident time reported that the wind conditions were very turbulent.

The circumstances of the accident were consistent with the pilot's loss of control shortly after taking off into reported high gusting wind.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's decision to depart in turbulent and gusting wind conditions, which resulted in a loss of control and impact with terrain.

Findings

Personnel issues	Decision making/judgment - Pilot
Aircraft	Altitude - Not attained/maintained
Environmental issues	High wind - Contributed to outcome
Environmental issues	Gusts - Contributed to outcome
Aircraft	Maximum weight - Capability exceeded

Factual Information

History of Flight

Initial climb	Loss of control in flight (Defining event)

On August 11, 2022, at 1152 Alaska daylight time, a Piper PA-12 airplane, N3937M, was substantially damaged when it was involved in an accident near Arctic Village, Alaska. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot was on a solo hunting trip and was returning home when the accident occurred. On the morning of the accident, the pilot sent messages between 0930 and 1030 that he was preparing to depart the area. There were no reported distress calls or other communications from the pilot. The following day, about 1140, a pilot spotted the wreckage about 2 nm west of Marsh Strip, a gravel airstrip located next to the Marsh Fork of the Canning River. The pilot who discovered the wreckage stated that on the afternoon of the accident, there was significant wind shear with sustained wind at least 20 kts and gusting to at least 30 kts. He stated that the wind gusts were violent, which made him park his airplane on an airstrip about 15 miles east of Marsh Strip and wait for the wind to subside. He added that another pilot who flew northbound over Marsh Strip about 1430 on the day of the accident reported that the wind was very turbulent.

A review of the data from the pilot's GPS revealed that at 1149 the airplane departed Marsh Strip to the south and then made a right turn into the valley, as seen in Figure 1. The flight track continued west up the valley about 300 to 400 ft agl for about 2 nm, then made a sharp left turn and descended to the ground. Figure 1 shows the end of the GPS flight track and the estimated accident location overlaid onto Google Earth.

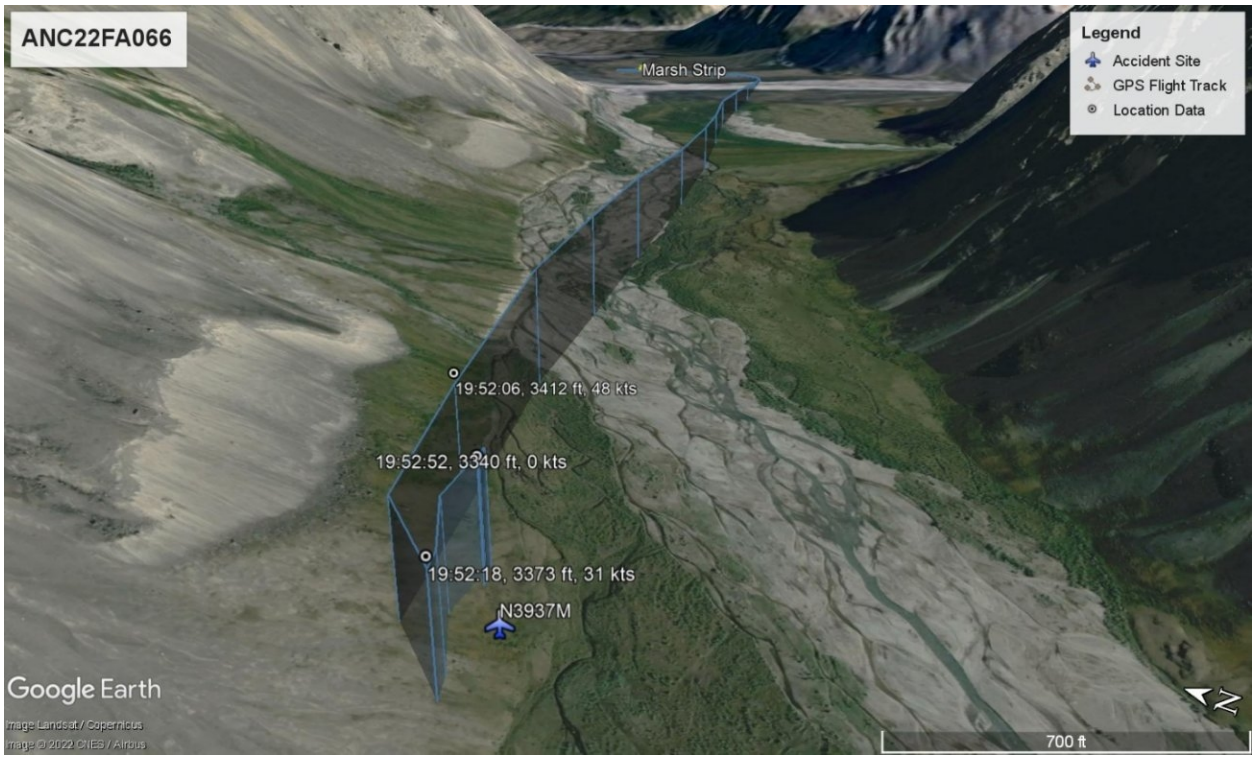

Figure 1. GPS flight track and accident location on Google Earth showing time (coordinated universal time [UTC]), ft above mean sea level (msl), and knots groundspeed.

Pilot Information

Certificate:	Private	**Age:**	57,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	June 8, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	May 25, 2022
Flight Time:	599.2 hours (Total, all aircraft), 14.3 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3937M
Model/Series:	PA-12	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	12-2825
Landing Gear Type:	Tailwheel	**Seats:**	3
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	1750 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, not activated	**Engine Model/Series:**	O-320-A2B
Registered Owner:	DOWNS DOUGLAS	**Rated Power:**	150 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

A witness stated that the accident pilot had fuel stored at the Chandalar Lake Airport (PALR), Chandalar Lake, Alaska, for his hunting trip into the mountains. The pilot stated to him that he was going sheep hunting and would return when he got a sheep. On August 7, 2022, the pilot arrived at PALR and refilled the airplane with two 5-gallon containers of fuel (10 gallons total). There were three remaining 5-gallon containers full of fuel. The containers were covered and in good condition.

Based on the GPS flight data and known fuel information, the estimated fuel onboard during the accident takeoff was about 14.15 gallons.

The most recent weight and balance completed for the airplane was on February 18, 2020. The empty weight was measured as 1,191.00 lbs. The mechanic who completed the weight and balance stated that he transposed the maximum gross weight of 1,838 lbs from previous weight and balance paperwork. He added that he was not aware of any modifications to the airplane that would have increased the maximum gross weight; therefore, the maximum gross weight should have been 1,750 lbs.

A postaccident weight and balance calculation, including fuel, revealed that the accident flight payload was about 620 lbs. The airplane's useful load was actually 559 lbs, and not 647 lbs as listed in the most recent weight and balance; therefore, the airplane was 61 lbs over maximum gross weight during the accident flight.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	3100 ft msl	**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:		**Visibility**	
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	20 knots / 30 knots	**Turbulence Type Forecast/Actual:**	/ Unknown
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/ Unknown
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:			
Departure Point:	Marsh Strip, AK	**Type of Flight Plan Filed:**	None
Destination:	Chandalar Lake, AK (PALR)	**Type of Clearance:**	None
Departure Time:	11:49 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	68.720123,-146.23407

The accident site featured an initial impact crater about 20 yards west of the airplane and the wreckage path was on a heading of 064°. On the right side of the impact crater was a disturbance in the ground that contained an inspection panel from the right wing. The main wreckage came to rest facing southeast and remained mostly intact (Figure 2).

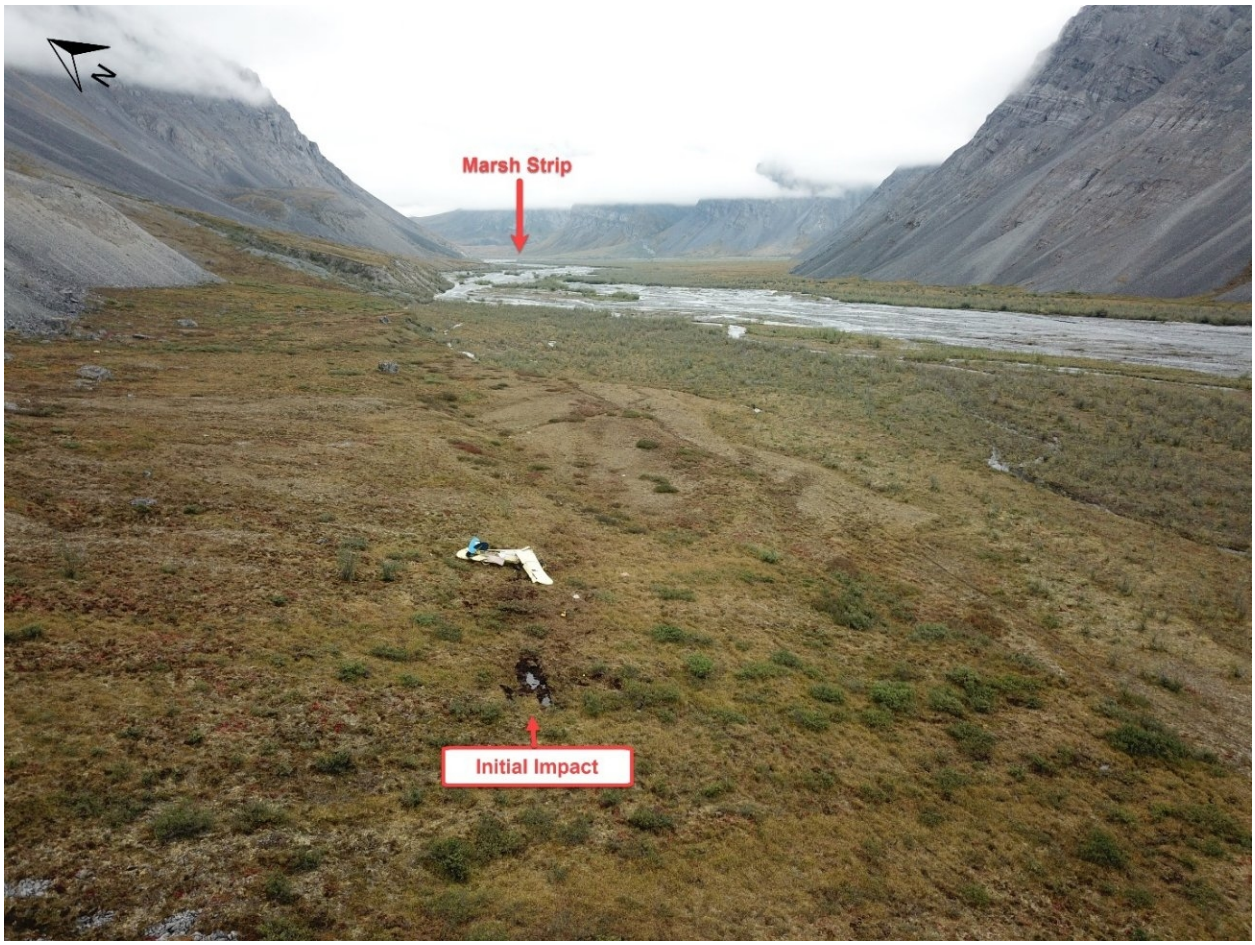

Figure 2. Aerial view of accident site.

Examination of the wreckage at the accident site revealed that the cockpit area was crushed upward and aft. The airplane was canted left with the left wing folded back underneath the fuselage. The left wing sustained leading crushing to the wing tip. The right wing sustained outboard leading edge damage and was bent upward near midspan. Flight control continuity was confirmed from all flight control surfaces, through a few impact separations, to the cockpit controls. The flaps were partially extended. The pitch trim jackscrew position corresponded to a full nose-up position. The payload/cargo onboard the airplane at the time of the accident became dislodged, and the exact preimpact location/station of the cargo could not be determined.

The pilot's seat floor mounts were separated from the fuselage. The pilot's restraint was a 3-point lap belt and shoulder harness and was found secured at each anchor. The lap belt was positioned around the pilot and each of the tongues was secured by the one-stroke release buckle. The shoulder harness was still attached to the roof mount, but the strap was pulled loose at the Y junction stitching and the rest of the shoulder harness was found loose around the pilot. The first responders observed the shoulder harness loose when they arrived at the scene.

There was a strong smell of fuel near the front of the airplane and the fuel tanks and fuel lines were compromised. The gascolator was intact and about half full of fuel, which tested negative for water contamination.

The engine remained partially attached to the engine mounts and firewall, and the cowling had separated. The engine had sustained minimal impact damage. The two-bladed propeller remained attached at the crankshaft flange. The propeller blades remained attached to the propeller hub and displayed leading edge gouging, torsional twisting, chordwise striations across the cambered surface and trailing edge “S” bending.

Examination of the airframe and engine did not reveal any preaccident mechanical malfunctions or failures that would have precluded normal operation.

Flight recorders

Garmin aera 660 GPS

The GPS was in good condition and the data was downloaded normally using the manufacturer’s procedure. The data extracted included 27 track logs from June 12, 2022, through August 11, 2022. The accident flight was recorded starting 19:46:31 UTC and ending 19:52:52 UTC on August 11, 2022. The GPS stored several user-set waypoints, of which one was “MSHFRK 02”, which is located near the beginning of the accident flight recording. The GPS began recording at 19:46:31 UTC and data consistent with a taxi lasted about half a minute between a GPS altitude of 2,780 and 2,790 ft. The GPS recorded an increase in speed beginning at 19:49:07 UTC. The airplane departed to the south and made a sharp right turn west. Throughout the flight, the airplane maintained a GPS groundspeed of between 40 and 50 kts. The airplane reached a maximum GPS altitude of 3,412 ft at 19:52:06, and then made 2 turns before the end of the data, which include an increase in recorded groundspeed to 70 kts at 19:52:21 before decreasing to 0 kts. The data ceased recording at 19:52:52 UTC, about 2.25 nautical miles west of the initial data point.

JPI Engine Data Monitor EDM-700

The device sustained minor impact damage to the exterior casing, but it was in operable condition and the data was downloaded normally using the manufacturer’s procedure.The EDM recording contained a number of hours of data over multiple power cycles. The accident flight was the last flight of the recording. The data showed a constant and steady increase in cylinder head temperatures (CHT) and exhaust gas temperatures (EGT) until the end of the recording. There were no anomalies noted in the data.

Administrative Information

Investigator In Charge (IIC):	Lindberg, Joshua
Additional Participating Persons:	Dustin Hopkins; Federal Aviation Administration; Fairbanks, AK Mark Platt; Lycoming Engines; Williamsport, PA
Original Publish Date:	June 26, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=105729

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.